

**In the Drawings:**

Please replace FIG. 2-1 to 2-8 with replacement drawings FIG. 2-1 to 2-8.

**REMARKS**

Claims 1-28 and 30-43 were pending prior to entering the amendments.

**The Amendments**

The Table at pages 43 and 44 is amended to insert SEQ ID NOs.

At page 45, an obvious typographic error of “figure 5” is amended to “figure 2;” there is no figure 5 in the application and the text refers to the frameshift peptide of Figure 2.

Claims 1-43 are cancelled. New Claims 44-79 are added.

Claim 44 is supported by FIG. 2-1 and 2-2.

Claim 45 is supported by original Claim 3(d), page 8, lines 27-29, page 10, line 27 to page 11, line 5.

Claim 46 is supported by page 11, lines 8-11.

Claim 47 is supported by FIG. 2-2, TAF1b (-1).

Claim 48 is supported by FIG. 2-2, TAF1b (+1).

Claim 49 is supported by FIG. 2-1, HT001 (-1).

Claim 50 is supported by FIG. 2-1, HT001 (+1).

Claims 51-56 are supported by page 22, lines 17-18.

Claims 57-62 are supported by page 34, lines 11-16.

Claim 63 is supported by original Claims 18, 24, and 30, FIG. 2-1, FIG. 2-2, page 22, lines 17-18.

Claim 64 is supported by original Claim 3(d), page 8, lines 27-29, page 10, line 27 to page 11, line 5.

Claim 65 is supported by page 11, lines 8-11.

Claim 66 is supported by FIG. 2-2, TAF1b (-1).

Claim 67 is supported by FIG. 2-2, TAF1b (+1).

Claim 68 is supported by FIG. 2-1, HT001 (-1).

Claim 69 is supported by FIG. 2-1, HT001 (+1).

Claim 70 is supported by FIG. 2-1, TGFbRII (-1).

Claim 71 is supported by FIG. 2-1, TGFbRII (+1).

Claim 72 is supported by original Claims 18, 24, and 30; FIGs. 2-1 and 2-2; and page 34, lines 11-16.

Claim 73 is supported by original Claim 3(d), page 8, lines 27-29, page 10, line 27 to page 11, line 5.

Claim 74 is supported by FIG. 2-2, TAF1b (-1).

Claim 75 is supported by FIG. 2-2, TAF1b (+1).

Claim 76 is supported by FIG. 2-1, HT001 (-1).

Claim 77 is supported by FIG. 2-1, HT001 (+1).

Claim 78 is supported by FIG. 2-1, TGFbRII (-1).

Claim 79 is supported by FIG. 2-1, TGFbRII (+1).

The amendments in the drawings (FIGs. 2-1 to 2-8) are to insert sequence ID numbers. A marked copy of the drawings which shows the changes are included.

No new matter is added in any of the amendment. The Examiner is requested to enter the amendments.

### **Election/Restriction**

Claims 3, 4, 11, 17, 30 and 31 were examined.

New Claims 40-50 correspond to the invention of Claim 3. New Claims 51-56 correspond to the invention of Claim 11. New claims 57-62 correspond to the invention of Claim 17. New Claims 63-69 correspond to the invention of Claim 30 (a).

New Claim 70-79 correspond to the elected invention, i.e., the combination of at least three polypeptides HT001, GGFBR2, and TAF1B (see Restriction Requirement at page 4, Group I, dated January 11, 2008, and Response to Restriction Requirement dated July 9, 2008).

### **The Response**

#### **35 U.S.C. §101 Rejection**

Claims 3 and 4 are rejected under 35 U.S.C. 101. Claims 3-4 are cancelled.

New Claim 44 recites an isolated frameshift polypeptide. Therefore, the §101 Rejection should be withdrawn.

### **Claim Objections**

Claims 4 and 31 are objected to under 37 CFR 1.75(c), as being of improper dependent form. Claims 4 and 31 are cancelled.

### **35 U.S.C. § 112, First Paragraph, Rejection – Written Description**

Claims 3, 4, 11, 17, 30, and 31 are rejected under 35 U.S.C. 112, first paragraph, as allegedly failing to comply with the written description requirement for the following reasons:

Claims 3, 4, 11, 17, 30, and 31 are cancelled.

New Claims 44-79 are directed to frameshift polypeptide TAF1b (-1) ORF, TAF1b (+1) ORF, TAF1b (-2) ORF, HT001 (-1) ORF, HT001 (+1) ORF, HT001 (-2) ORF, TGFbRII (-1) ORF, TGFbRII (+1) ORF, and TGFbRII (-2). Each of the sequences is identified in FIGs. 2-1 and 2-2.

Therefore, the written description rejection should be withdrawn.

### **35 U.S.C. § 102(b) Rejection**

Claims 3, 4, 11, 17, 30, and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Yang et al (Molecular and Cellular Biology, November 1996, 16(11):6603-6616). The rejection is traversed.

Yang et al. disclose that GCN3, GCD7 and GCD2 are regulatory domains in the guanine nucleotide exchange factor eIF2B. These proteins do not have any relationship to the subject matter of the present application. Furthermore, Yang et al. do not disclose the amino acid sequences of the claimed frameshift polypeptides of SEQ ID Nos: 2, 3, 20, 21, and 117-120.

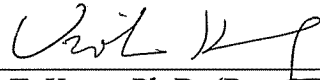
Therefore, the 102(b) rejection should be withdrawn.

**CONCLUSION**

Applicants believe that the application is now in good and proper condition for allowance.  
Early notification of allowance is earnestly solicited.

Respectfully submitted,

Date: March 23, 2009

  
\_\_\_\_\_  
Viola T. Kung, Ph.D. (Reg. No. 41,131)

Enclosures: Replacement Drawings and Marked-Up Drawings

**HOWREY LLP**

2941 Fairview Park Drive, Box 7  
Falls Church, VA 22042  
Tel: (650) 798-3570  
Fax: (650) 798-3600

FIG. 2-1

**HT001****wt ORF (SEQ ID NO: 1)**

MQRPNNAHRISQPIRQIIYGILLNAPHLDKTSWNALPPQPLAFSEVERINKNIRTSIIDAVELAKDHSLSRLTELSLRRRQMLLETALKV  
 KQTILEPIPTSLKLPVAVSCYWLQHTETKAKLHHLQSLLLTMLVGPLIAIINSPGKEELQEDGAKMLYAEFQVRVKAQTRLGTRLDLDTAHI  
 FCQWQSCLQMGMYNQLLSTPLPEPDLTRLVSGSLVHGLCQQLLASTSVESLLSICPEAKQLEYLFNATRSYAPAEIFLPKGRSNSK  
 KKRQKKQNTSCSKNRGRRTTAHTKCWYEGNNRFGLLMVENLEEHSSEASNIE

**(-1) ORF (SEQ ID NO: 2)**

MQRPNNAHRISQPIRQIIYGILLNAPHLDKTSWNALPPQPLAFSEVERINKNIRTSIIDAVELAKDHSLSRLTELSLRRRQMLLETALKV  
 KQTILEPIPTSLKLPVAVSCYWLQHTETKAKLHHLQSLLLTMLVGPLIAIINSPGKEELQEDGAKMLYAEFQVRVKAQTRLGTRLDLDTAHI  
 FCQWQSCLQMGMYNQLLSTPLPEPDLTRLVSGSLVHGLCQQLLASTSVESLLSICPEAKQLEYLFNATRSYAPAEIFLPKGRSNSK  
 KKGRNRIPAVLRTEGEPLHTPSVGMRETTGLGC

**(+1)/(-2) ORF (SEQ ID NO: 3/118)**

MQRPNNAHRISQPIRQIIYGILLNAPHLDKTSWNALPPQPLAFSEVERINKNIRTSIIDAVELAKDHSLSRLTELSLRRRQMLLETALKV  
 KQTILEPIPTSLKLPVAVSCYWLQHTETKAKLHHLQSLLLTMLVGPLIAIINSPGKEELQEDGAKMLYAEFQVRVKAQTRLGTRLDLDTAHI  
 FCQWQSCLQMGMYNQLLSTPLPEPDLTRLVSGSLVHGLCQQLLASTSVESLLSICPEAKQLEYLFNATRSYAPAEIFLPKGRSNSK  
 KK(K)AEETEYQLF

**U79260****wt ORF (SEQ ID NO: 4)**

MGHPRAIQPSVFFSPYDVHFLLYPIRCPYLKIGRFHIKLGKHLFLFSFLFFFETQSHSVTRLECSGTISAHCNLCPLGSSNSPASASRV  
 AGTAGTCRRAQLIFVFLAEMGFHHVGRDGLDNLVIHPPRSPKALGLQA

**(-1) ORF (SEQ ID NO: 5)**

MGHPRAIQPSVFFSPYDVHFLLYPIRCPYLKIGRFHIKLGKHLFLFSFLFFF LRHSLTSPGWSAVARSRLTATSASQVQVILLPQPPEW  
LGLQARAAAPS

**(+1)/(-2) ORF (SEQ ID NO: 6)**

MGHPRAIQPSVFFSPYDVHFLLYPIRCPYLKIGRFHIKLGKHLFLFSFLFFF(F)

**PTHL3****(wt) ORF (SEQ ID NO: 7)**

MQRRLVQQWSVAVFLLSYAVPSCGRSVEGLSRRLKRAVSEHQLLHDKGKSIQDLRRRFFLHHLIAEIHAEIRATSEVSPNSKPSNPNT  
 KNHPVRFGSDDEGRYLTQETNKVETYKEQPLKTPGKKKKGKPGKRKEQEKKRRRTRSAWLDSGVTGSGLEGDHLSDTSTTSLELD  
 SRTALLWGLKKKKENNRTHHQMISLFSKPLLL

**(-1) ORF (SEQ ID NO: 8)**

MQRRLVQQWSVAVFLLSYAVPSCGRSVEGLSRRLKRAVSEHQLLHDKGKSIQDLRRRFFLHHLIAEIHAEIRATSEVSPNSKPSNPNT  
 KNHPVRFGSDDEGRYLTQETNKVETYKEQPLKTPGKKKKGKPGKRKEQEKKRRRTRSAWLDSGVTGSGLEGDHLSDTSTTSLELD  
 SRTALLWGLKKKK KKTTEEHIICN

**(+1)/(-2) ORF (SEQ ID NO: 9)**

MQRRLVQQWSVAVFLLSYAVPSCGRSVEGLSRRLKRAVSEHQLLHDKGKSIQDLRRRFFLHHLIAEIHAEIRATSEVSPNSKPSNPNT  
 KNHPVRFGSDDEGRYLTQETNKVETYKEQPLKTPGKKKKGKPGKRKEQEKKRRRTRSAWLDSGVTGSGLEGDHLSDTSTTSLELD  
 SRTALLWGLKKK(K) GKQQKNTSYATNDLI

**TGFbRII****(wt) (SEQ ID NO: 10)**

MGRGLLRGLWPLHIVLWTRIASTIPPHVQKSVNNDMIVTDNNGAVKFPQLCKFCDFVRFSTCDNQKSCMSNCSITSICEKPQEVCAV  
 WRKNDENITLETVCHDPKLPYHDFILEDAASPKCIMKEKKKPGETFFMCSCSSDECNDNIFSEEYNTSNPDLLLIVFQVTGISLLPPLG  
 VAISVIIIFYCYRVNRQQLSSTWETGKTRKLMFSEHCAILEDSDRSDISSTCANNINHNTELLPIELDTLVGKGRFAEVYKAKLKQNTS  
 EQFETVAVKIFPYEEYASWKTEKDIFSDINLKHENILQFLTAEERKTELKQYWLITAFHAKGNLQEYLTRHVISWEDLRKLGSSESLARGI  
 AHLHSDHTPCGRPKMPIVHRDLNSSLNVLKNDLTCCCLCDFGLSLRLDPTLSVDDLANSGQVGTARYMAPEVLESRMNLENAESFKQT  
 DVYSMALVLWEMTSRCNAVGEVKDYEPFPGSKVREHPCVESMKDNVLRDRGRPEIPSWFLNHQGIQMVCELTTECWDHDPPEARLT  
 AQCVAERFSELEHLDRLSGRSCSEEKIPEDGSLNTTK

**(-1) ORF (SEQ ID NO: 11)**

MGRGLLRGLWPLHIVLWTRIASTIPPHVQKSVNNDMIVTDNNGAVKFPQLCKFCDFVRFSTCDNQKSCMSNCSITSICEKPQEVCAV  
 WRKNDENITLETVCHDPKLPYHDFILEDAASPKCIMKEKK SLVRLSSCVPALMSAMTTSSSQKNITPAITCC

**(+1)/(-2) ORF (SEQ ID NO: 12/119)**

MGRGLLRGLWPLHIVLWTRIASTIPPHVQKSVNNDMIVTDNNGAVKFPQLCKFCDFVRFSTCDNQKSCMSNCSITSICEKPQEVCAV  
 WRKNDENITLETVCHDPKLPYHDFILEDAASPKCIMKEKK(K) AW

**MACS****(wt) ORF (SEQ ID NO: 13)**

MGAQFSKTAAGGAAAERPGEAAVASSPSKANGQENGHVKNVDASPAAAESGAKEELQANGSAPAADKEEPAAGSGAASPSS  
 AEKGEPAAAAAPEAGASPVKEAPAEGEAAEPGSATAAEGEAAASSTSSPKAEDGATPSPSNETPKKKKKRFSFKKSKLGSF  
 FKKNKKEAGEGGEAEAPAAEGGKDEAAGGAAAAAAEAGAASGEQAAAPGEEAAAGEEGAAGGDPQEAQKQEAAPAEKPPASDE  
 TKAAEEPSKVEEKKAEAEAGASAAACEAPSAAGPGAPPEQEAAPAEPPAAAAASSACAAPSQEAQPECSPEAPPAAEAE

**(-1) ORF (SEQ ID NO: 14)**

MGAQFSKTAAGGAAAERPGEAAVASSPSKANGQENGHVKNVDASPAAAESGAKEELQANGSAPAADKEEPAAGSGAASPSS  
 AEKGEPAAAAAPEAGASPVKEAPAEGEAAEPGSATAAEGEAAASSTSSPKAEDGATPSPSNETPKKK RSAPPSRSLSS

**(+1)/(-2) ORF (SEQ ID NO: 15)**

FIG. 2-2

MGAQFSKTAAGAAAERPGEAAVASSPSKANGQENGHVKNVDASPAAAESGAKEELQANGSAPAADKEEPAAGSGAASPSS  
AEKGEPAAAAAEPAGASPVEKEAPAEGEAAEPGSATAAEGEAAASAASSTSSPKAEDGATPSPSNETPKKK(K)EALFLQEVFQAERL  
LLQEEQEGGWRRR

## TCF-4

(wt)ORF (Seq 10 NO: 16)

MPQLNGGGGDDLGADELISFKDEGEQEEKSSENSSAERDLADVKSLLVNESETNQNSSSDSEAEERRPPRSESFRDKSRESLEEA  
AKRQDGGGLFKGPPYPGYPFIMIPDLTSPYLPNGSLSPARTYLQMKWPLLDVQAGSLQSRQALKDARSPSPAHIVSNKVPVQHPHH  
VHPLTPLITYSNEHFTPGNPPPHLPADVDPKTGIPRPPHPPDISPYPLSPGTVGQIPHPLGWLVPQQGQPVYPITGGFRHPYPTALT  
VNASVSRFPPHMPVPHHTLHTTGIPHPAIVTPTVKQESSQSDVGSLSHSSKHQDSKKEEEKKKPHIKPLNAFMYMKEMRAKVVAEC  
TLKESAAINQILGRRWHALSREEQAKYYELARKERQLHMQLYPGWSARDNYGKKKKRKRDKQPGETNEHSECFLNPCLSLPPITDLS  
APKKCRARFGLDQQNNWCGPCRRKKKCVRYIQGEGSCLSPSSDGLSDSPSPNLLGSPPRDAKSQTEQTQPLSLSLKPDPLAH  
LSMMPPPPALLAEATHKASALCPNGALDLPAAALQPAAPSSSIAQPSTSWLHSHSSLAGTQPQPLSLVTKSLE

(-1)ORF (Seq 10 NO: 17)

MPQLNGGGGDDLGADELISFKDEGEQEEKSSENSSAERDLADVKSLLVNESETNQNSSSDSEAEERRPPRSESFRDKSRESLEEA  
AKRQDGGGLFKGPPYPGYPFIMIPDLTSPYLPNGSLSPARTYLQMKWPLLDVQAGSLQSRQALKDARSPSPAHIVSNKVPVQHPHH  
VHPLTPLITYSNEHFTPGNPPPHLPADVDPKTGIPRPPHPPDISPYPLSPGTVGQIPHPLGWLVPQQGQPVYPITGGFRHPYPTALT  
VNASVSRFPPHMPVPHHTLHTTGIPHPAIVTPTVKQESSQSDVGSLSHSSKHQDSKKEEEKKKPHIKPLNAFMYMKEMRAKVVAEC  
TLKESAAINQILGRRWHALSREEQAKYYELARKERQLHMQLYPGWSARDNYGKKKKRKRDKQPGETNEHSECFLNPCLSLPPITDLS  
APKKCRARFGLDQQNNWCGPCRRKKKSAFATYKVKAAASAHLQMEAY

(+1)/(-2)ORF (Seq 10 NO: 18)

MPQLNGGGGDDLGADELISFKDEGEQEEKSSENSSAERDLADVKSLLVNESETNQNSSSDSEAEERRPPRSESFRDKSRESLEEA  
AKRQDGGGLFKGPPYPGYPFIMIPDLTSPYLPNGSLSPARTYLQMKWPLLDVQAGSLQSRQALKDARSPSPAHIVSNKVPVQHPHH  
VHPLTPLITYSNEHFTPGNPPPHLPADVDPKTGIPRPPHPPDISPYPLSPGTVGQIPHPLGWLVPQQGQPVYPITGGFRHPYPTALT  
VNASVSRFPPHMPVPHHTLHTTGIPHPAIVTPTVKQESSQSDVGSLSHSSKHQDSKKEEEKKKPHIKPLNAFMYMKEMRAKVVAEC  
TLKESAAINQILGRRWHALSREEQAKYYELARKERQLHMQLYPGWSARDNYGKKKKRKRDKQPGETNEHSECFLNPCLSLPPITDLS  
APKKCRARFGLDQQNNWCGPCRRKK(K)VRSLHTR

## TAF1b

(wt)ORF (Seq 10 NO: 19)

IPAFAGTVLQPFPEAALATRVTPAVEAPAAPRLDLEEESEEFKERCTQCAAVSWGLTDEGKYCTSCHNVTERYQEVNTNDLIPNT  
QIKALNRGLKKKNNTTEKGDWVYVCEGFQYILYQQAELKNLGVGPGLKNDVLHNFVKRYLQKSKQAYCKNPVYTTGRKPTVLEDNL  
SHSDWASEPELLSDVSCPPFLESQAESQSDIHRKPPFVSKASQSETSVCSGSLDGVESQKKEGIVKMTMPQTAFCYLSLLWQ  
REAITLSDLLRFVEEDHIPYINAFQHFPEQMPLYGRDRGIFGIESWPDYEDYKKTIEVGTFLDLPRFPDITEDCYLHPNLCMKYLMV  
LPDEMHSLTCHVVKMTGMGEVDFTFDPIAKMAKAVKYDVQAVAIIVVLKLLFLMDDSFWSLSNLAELKNEKNKKDKPWFDFRKV  
YQIMKKADEKKQKWEEARAKYLWKSEKPLYYSFVDKPVAYKKREMVNLQKQFSTLVDSTATAGKSPSSSFQFNWTEEDTDRTC  
FHGHSLOQVYLKEKGQSLTKNSLYWLSTQKFCRW

(-1)ORF (Seq 10 NO: 20)

IPAFAGTVLQPFPEAALATRVTPAVEAPAAPRLDLEEESEEFKERCTQCAAVSWGLTDEGKYCTSCHNVTERYQEVNTNDLIPNT  
QIKALNRGLKKK(TILKKAGIGMCVKVSSIFFINKQKP)

(+1)/(-2)ORF (Seq 10 NO: 21/120)

IPAFAGTVLQPFPEAALATRVTPAVEAPAAPRLDLEEESEEFKERCTQCAAVSWGLTDEGKYCTSCHNVTERYQEVNTNDLIPNT  
QIKALNRGLKKK(K)QY

## AC-1

(wt)ORF (Seq 10 NO: 22)

MDTQKQIHKTHNSKNQFFTIFFLSVEFGKEGTRKNFYLLLSIGHYGRKSRRADLTADTADKTEPECFAASWTFDPNPSVTVSGAHS  
TAVHQ

(-1)ORF (Seq 10 NO: 23)

MDTQKQIHKTHNSKNQFFTIFFSCQLNLGRKEHAKIFTFFFQLDMDGNGELTLELQTLQIKSQSNALLPAGPLTQTPV

(+1)/(-2)ORF (Seq 10 NO: 24)

MDTQKQIHKTHNSKNQFFTIFF(F)PVS

## Sec63

(wt)ORF (Seq 10 NO: 25)

MAGQQFQYDDSGNTFFYFLTSFVGLVIPATYYLWPRDQNAEQIRLKNIRKVYGRCMWYRLRLKQPQNIPTVKIVLLAGWALFLFL  
AYKVSKTREYQEYNPYEVLNLDPGATVAEIKKQYRLLSLYHPDKGGDEVFMFRIAKAYAALTDEESRKNWEEFGNPDGPQATSF  
GIALPAWIVDQKNSILVLLVYGLAFMVLPPVVGSWWYRSIRYSGDQILRTTQIYTYFYKTRNMDMKRLIMVLGASEFDPQYNKDAT  
SRPTDNILPQLIREIGSINLKKNEPPLTCPYSLKARVLLSLHARMKIPETLEEDQQFMLKKCPALLQEMVNVICQLIVMARNREEREFR  
APTLASLNCMKLSQMAVQGLQQFKSPLLQLPHIEEDNLRRVSNHKKYKIKTIQDLVSLKESDRHTLLHFEDEKYEYEMAVLGSFPY  
VTMDIKSQVLDDSDSNITVGSVLTVLVCLTRQTMAEVFEKEQSICAAEEQPAEDGQGETNKNRTKGGWQQKSKGPKKTAKSKKKK  
PLKKKPTPVLLPQSKQKQKQANGVVGNEAAVKEDEEEVSDKGSDEEEETNRDSQSEKDDGSDRDSREQDEKQNKDDEAEV  
QELQQSIQRKERALLETSKITHPVYSLYFPEEKQEWWWLYIADRKEQTLISMPYHVCTLKDTEEVELKFPAPGKPGNYQYTVFLRS  
SYMGLDQIKPLKLEVHEAKPVENHPQWDTAIEGDEDQEDSEGFEDSFEEDDEEDD

(-1) 9er A-Repeat (Seq 10 NO: 26)

MAGQQFQYDDSGNTFFYFLTSFVGLVIPATYYLWPRDQNAEQIRLKNIRKVYGRCMWYRLRLKQPQNIPTVKIVLLAGWALFLFL  
AYKVSKTREYQEYNPYEVLNLDPGATVAEIKKQYRLLSLYHPDKGGDEVFMFRIAKAYAALTDEESRKNWEEFGNPDGPQATSF  
GIALPAWIVDQKNSILVLLVYGLAFMVLPPVVGSWWYRSIRYSGDQILRTTQIYTYFYKTRNMDMKRLIMVLGASEFDPQYNKDAT  
SRPTDNILPQLIREIGSINLKKNEPPLTCPYSLKARVLLSLHARMKIPETLEEDQQFMLKKCPALLQEMVNVICQLIVMARNREEREFR  
APTLASLNCMKLSQMAVQGLQQFKSPLLQLPHIEEDNLRRVSNHKKYKIKTIQDLVSLKESDRHTLLHFEDEKYEYEMAVLGSFPY  
VTMDIKSQVLDDSDSNITVGSVLTVLVCLTRQTMAEVFEKEQSICAAEEQPAEDGQGETNKNRTKGGWQQKSKGPKKTAKSKKKR

FIG. 2-3

**(+1)/(-2) 9er A-Repeat (SEQ ID NO: 27)**

MAGQQFQYDDSGNTFFYFLTSFVGLVIPATYYLWPRDQNAEQIRLKNIRKVYGRCMWYRLRLLPQPNIIPTVKKIVLLAGWALFLFL  
 AYKVSKTREYQEYNPYEVLNLDPGATVAEIKKQYRLLSLKYHPDKGGDEVFMFRIAKAYAALTDEESRKNWEEFGNPDGPQATSF  
 GIALPAWIVDQKNSILVLLVYGLAFMVILPVVVGSWWYRSIRYSGDQILIRTTQIYTYFVYKTRNMDMKRLIMVLGASEFDPQYNKDAT  
 SRPTDNILIPQLIREIGSINLKKNEPPLTCPYSLKARVLLSLHARMKIPETLEEDQQFMLKKCPALLQEMVNVICQLIVMARNREEREFR  
 APTLASLNCMKLSQMAVQGLQQFKSPLLQLPHIEEDNLRVSNHKKYKIKTIQDLVSLKESDRHTLLHFEDEKYEEMAVLGSFPY  
 VTMDIKSQVLDDSDSNITVGSGLVTVLKLTRQTMAEVFEKEQSICAAEEQPAEDGQGETNKNRTKGGWQQ  
 KSKGPKKTAKSKK(K)ETFKKKTYTCAITTVKATETKAGKWSRWE

**(-1) 10er A-Repeat (SEQ ID NO: 28)**

MAGQQFQYDDSGNTFFYFLTSFVGLVIPATYYLWPRDQNAEQIRLKNIRKVYGRCMWYRLRLLPQPNIIPTVKKIVLLAGWALFLFL  
 AYKVSKTREYQEYNPYEVLNLDPGATVAEIKKQYRLLSLKYHPDKGGDEVFMFRIAKAYAALTDEESRKNWEEFGNPDGPQATSF  
 GIALPAWIVDQKNSILVLLVYGLAFMVILPVVVGSWWYRSIRYSGDQILIRTTQIYTYFVYKTRNMDMKRLIMVLGASEFDPQYNKDAT  
 SRPTDNILIPQLIREIGSINLKKNEPPLTCPYSLKARVLLSLHARMKIPETLEEDQQFMLKKCPALLQEMVNVICQLIVMARNREEREFR  
 APTLASLNCMKLSQMAVQGLQQFKSPLLQLPHIEEDNLRVSNHKKYKIKTIQDLVSLKESDRHTLLHFEDEKYEEMAVLGSFPY  
 VTMDIKSQVLDDSDSNITVGSGLVTVLKLTRQTMAEVFEKEQSICAAEEQPAEDGQGETNKNRTKGGWQQ  
 KSKGPKKTAKSKKKKPLK(K)NHLHCYYHSQSNRNKSRQMESLGMKLQ

**(+1)/(-2) 10er A-Repeat (SEQ ID NO: 29)**

MAGQQFQYDDSGNTFFYFLTSFVGLVIPATYYLWPRDQNAEQIRLKNIRKVYGRCMWYRLRLLPQPNIIPTVKKIVLLAGWALFLFL  
 AYKVSKTREYQEYNPYEVLNLDPGATVAEIKKQYRLLSLKYHPDKGGDEVFMFRIAKAYAALTDEESRKNWEEFGNPDGPQATSF  
 GIALPAWIVDQKNSILVLLVYGLAFMVILPVVVGSWWYRSIRYSGDQILIRTTQIYTYFVYKTRNMDMKRLIMVLGASEFDPQYNKDAT  
 SRPTDNILIPQLIREIGSINLKKNEPPLTCPYSLKARVLLSLHARMKIPETLEEDQQFMLKKCPALLQEMVNVICQLIVMARNREEREFR  
 APTLASLNCMKLSQMAVQGLQQFKSPLLQLPHIEEDNLRVSNHKKYKIKTIQDLVSLKESDRHTLLHFEDEKYEEMAVLGSFPY  
 VTMDIKSQVLDDSDSNITVGSGLVTVLKLTRQTMAEVFEKEQSICAAEEQPAEDGQGETNKNRTKGGWQQ  
 KSKGPKKTAKSKKKKPLK(K)TYTCAITTVKATETKAGKWSRWE

**Caspase 5****(wt)ORF (SEQ ID NO: 30)**

MFKGILQSGLDNFVINHMLKNNVAGQTSIQTLVPNTDQKSTSVKKDNHKKKTKVMLEYLGKDVHGVFNLYLAKHDVLTKEEEKKKYY  
 DAKIEDKALILVDSLNRKRVAHQMFQTLLNMDQKITSVKPLQIEAGPPESAESTNILKCPREEFLRLCKKNHDEIYPIKKREDRRRLA  
 LIICNTKFDHLPARNGAHYDIVGMKRLQLGLGYTVVDEKNLTARDMESVLRFAFAARPEHKSSDSTFLVLMHSGILEGICGTAHKKKKP  
 VLLYDTIFQIFNNRCLSLKDKPKVIIVQACRGEKHGELWVRDSPASLAVISSQSENLEADSVCKIHEEKDFIAFCSSSTPHNVSWDR  
 TRGSIFITELITCFQKYSCCCHLMEIFRKVQKSFEVPOAKAQMPPTIERATLTRDFYLFPGN

**(-1)ORF (SEQ ID NO: 31)**

MFKGILQSGLDNFVINHMLKNNVAGQTSIQTLVPNTDQKSTSVKKDNHKKK(K)QLRCWNTWAKMFFMVFLIWWQNTMF

**(+1)/(-2)ORF (SEQ ID NO: 32)**

MFKGILQSGLDNFVINHMLKNNVAGQTSIQTLVPNTDQKSTSVKKDNHKK(K)NS

**AIM2****(wt)ORF (SEQ ID NO: 33)**

MESKYKEILLTGLDNITDEELDRFKFFLSDEFNIATGKLHTANRIQVATLMIQNAGAVSAVMKTIRIFQKLNYMLLAKRLQEEKEKVDKQ  
 YKSVTKPKPLSQAEMSPAASAAIRNDVAKQRAAPKVSPHVKEQKQMVAAQESIREGFQKRCLPVMVLKAKKPFTFETQEGKQEMF  
 HATVATEKEFFVVKVFNTLLKDKFIPKRIIIARYYRHSGFLEVNSASRVLDAESDQKVNPLNIIRKAGETPKINTLQTQPLGTIVNGLFV  
 VQKVTEKKKILFDLSDNTGKMEVLGVRNEDTMCKEKGDKVRLTFFTLKNGEKLQLTSGVHSTIKVIKAKKK

**(-1)ORF (SEQ ID NO: 34)**

MESKYKEILLTGLDNITDEELDRFKFFLSDEFNIATGKLHTANRIQVATLMIQNAGAVSAVMKTIRIFQKLNYMLLAKRLQEEKEKVDKQ  
 YKSVTKPKPLSQAEMSPAASAAIRNDVAKQRAAPKVSPHVKEQKQMVAAQESIREGFQKRCLPVMVLKAKKPFTFETQEGKQEMF  
 HATVATEKEFFVVKVFNTLLKDKFIPKRIIIARYYRHSGFLEVNSASRVLDAESDQKVNPLNIIRKAGETPKINTLQTQPLGTIVNGLFV  
 VQKVTEKKKILFDLSDNTGKMEVLGVRNEDTMCKEKGDKVRLTFFTLKNGEKLQLTSGVHSTIKVIKAKKK(K)HREVKRTNSSQLV

**(+1)/(-2)ORF (SEQ ID NO: 35)**

MESKYKEILLTGLDNITDEELDRFKFFLSDEFNIATGKLHTANRIQVATLMIQNAGAVSAVMKTIRIFQKLNYMLLAKRLQEEKEKVDKQ  
 YKSVTKPKPLSQAEMSPAASAAIRNDVAKQRAAPKVSPHVKEQKQMVAAQESIREGFQKRCLPVMVLKAKKPFTFETQEGKQEMF  
 HATVATEKEFFVVKVFNTLLKDKFIPKRIIIARYYRHSGFLEVNSASRVLDAESDQKVNPLNIIRKAGETPKINTLQTQPLGTIVNGLFV  
 VQKVTEKKKILFDLSDNTGKMEVLGVRNEDTMCKEKGDKVRLTFFTLKNGEKLQLTSGVHSTIKVIKAKK(K)NIEK

**SLC23A1****(wt)ORF (SEQ ID NO: 36)**

MMGIGKNTTSKSMEAGSSTEGKYEDEAKHPAFFTLPVVINGGATSSGEQDNEDTELMAYTTENGIAEKSSLAETLDSTGSLDPQRS  
 DMIYTIEDVPPWYLICIFGLQHYLTCFSGTIAVPFLLADAMCVGYDQWATSQLIGTIFFCVGITLLQTTFFGCRPLPFQTSFAFLAPARA  
 ILSLDKWKCNNTDVSANGTAELLHTEHIWYPRIREIQGAIIMSSLIEVVIGLLGLPGALLKYIGPLTITPTVALIGLSGFQAAGERAGKHW  
 GIAMLTIFLVLLFSQYARNVKFPLPIYKSKKGWTAAYKLQLFKMFPIILAILVSWLLCFITVTDVFPDSTKYGFYARTDARQGVLLVAPW  
 FKVPYFQWGLPTVSAAGVIGMLSAYVASIIESIGDYYACARLSCAPPPPIHAINRGIFVEGLSCVLDGIFGTGNGSTSSPNIGVIGITK  
 VGSRRVIQCGAALMLALGMIGKFSALFASLPDPVLGALFCTLFGMTAVGLSNLQFIDLNSSRNLFVLGFSIFFGLVLPYLRQNPLVTGI  
 TGIDQVLNVLLTTAMFVGCCVAFILDNTIPGTPEERGIRKWKKGVGKGNKSLDGMESYNLPFGMNIKKYRCFSYLPISPTFVGYTWK  
 GLRKSNSRSDSDSQATG

**(-1)ORF (SEQ ID NO: 37)**

MMGIGKNTTSKSMEAGSSTEGKYEDEAKHPAFFTLPVVINGGATSSGEQDNEDTELMAYTTENGIAEKSSLAETLDSTGSLDPQRS  
 DMIYTIEDVPPWYLICIFGLQHYLTCFSGTIAVPFLLADAMCVGYDQWATSQLIGTIFFCVGITLLQTTFFGCRPLPFQTSFAFLAPARA  
 ILSLDKWKCNNTDVSANGTAELLHTEHIWYPRIREIQGAIIMSSLIEVVIGLLGLPGALLKYIGPLTITPTVALIGLSGFQAAGERAGKHW  
 GIAMLTIFLVLLFSQYARNVKFPLPIYKSKKGWTAAYKLQLFKMFPIILAILVSWLLCFITVTDVFPDSTKYGFYARTDARQGVLLVAPW  
 FKVPYFQWGLPTVSAAGVIGMLSAYVASIIESIGDYYACARLSCAPPPPISTQ

**(+1)/(-2)ORF (SEQ ID NO: 38)**



FIG. 2-4

MMGIGKNTTSSKMEAGSSTEGKYEDEAKHPAFFTLPPVINGGATSSGEQDNEDTELMAYTTENGIAEKSSLAETLDSTGSLDPQRS  
 DMIYTTIEDVPPWYLICIFLGLQHYLTCSGSIAPVFLADAMCVGYDQWATSQSLIGTIFFCVGITLLQTTFGCRLPLFQTSFAFLAPARA  
 ILSLDKWKCNTTDSVANGTAELLHTEHIWYPRIREIQGAIIMSSLIEVVIGLLGLPGALLKYIGPLTITPTVALIGLSGFQAAGERAGKHW  
 GIAMLTIFLVLLFSQYARNVKFPLPIYKSKKGWTAAYKLQLFKMFPIILALVSWLLCFITVTDVFPDSTKYGFYARTDARQGVLVAPW  
 FKVPYPFQWGLPTVSAAGVIGMLSAAVVASIIESIGDYYACARLSCAPP

(P)HPRNKQGNFRGRPLLS

ABCF1

(wt)ORF (SEQ ID NO: 39)

MPKAPKQQPPEPEWIGDGESTSPSDKVVKKGKKDKKIKKTFFEEELAVEDKQAGEEEKVLKEKEQQQQQQQQQKKKRDTRKGRR  
 KKDVDDDGEEKELMERLKKLSVPTSDEEDEVPAKPRGGKKTGGNVFAALIQDQSEEEEEEEKHPPKPAKPEKNRINKAVSEEQQ  
 PALKGKKGKEEKSKGKAKPQNKFAALDNEEDKEEEIIEKEPPKQGGKEKAKKAEQMEYERQVASLKAANAENDFSVQAEMSSR  
 QAMLENASDIKLEKFSISAHGKELFVNADLYIVAGRRYGLVGPNGKGKTTLLKHIANRALSIPPNIIDVLLCEQEVVADETPAVQAVLRAD  
 TKRLKLEEEERRLQGGLEQGGDDTAERLEKVEELRATGAAAAEAKARRILAGLGFDPQMQRPTQKFSGGWRMRVSLARALFMEP  
 TLLMLDEPTNHLDLNNAVIWLNLYLQGWRTLLIVSHDQGLDDVCTDIIHLDAQRLHYRGNMTFKKMYQQQKQKELLKQYEQKQKLL  
 KELKAGGKSTKQAEKQTKALTRKQKQKRRKNQDEESQEAPELLKRPKEYTVRFTFPDPPPLSPPVLGLHGVTFGYQQGKPLFKNL  
 DFGIDMDSRICIVGPNVGVKSTLLLLLTGKLTPTHGEMRKNHRLKIGFFNQQAQQLRMEETPTTEYLQRGFNLQPYQDARKCLGRFGLE  
 SHAHTIQICKLSGGQKARVFAELACREPDVILDEPTNNDIESIDALGEAINEYKGAIVVSHDARLITETNCQLVWVVEEQSVSQIDG  
 DFEDYKREVLALGEVMSRPRE

(-1)ORF (SEQ ID NO: 40)

MPKAPKQQPPEPEWIGDGESTSPSDKVVKKGKKDKKIKKTFFEEELAVEDKQAGEEEKVLKEKEQQQQQQQQQKKKSEIPEKAGGR  
RMWMMMEKRKSSWSVLRSSQCQPMRRMKYPPQNPAGRKPVRVVMFLQ

(+1)/(-2)ORF (SEQ ID NO: 41)

MPKAPKQQPPEPEWIGDGESTSPSDKVVKKGKKDKKIKKTFFEEELAVEDKQAGEEEKVLKEKEQQQQQQQQQKK(K)ARYPKRQA  
EEGCG

HSPC259

(wt)ORF (SEQ ID NO: 42)

SPDYFPQISSQFGTVEK  
 MEKIFISSSTKAEKGISPFAPINTQAPPEKGKEAVVQEPERSWFQTKEERKKEKIAKALQEFDLALRGKKRKKKFMKDAKKKGEMT  
 AEERSQFEILKAQMFAERLAKRNRRAKRARAMPEEEEPVRGPAKKQKQGGKSVFDEELTNTSKKALKQYRAGPSFEERKQLGLPHQR  
 RGGNFKSNPDTRGGSSCRGLKKFMGAALKSLPCGKSSWLVLCLFSICLKKKQKQKTTLWCGGMVRSYFPHVCQSPFLISFHMILT  
 NGSIFGKRE

(-1)ORF (SEQ ID NO: 43)

MEKIFISSSTKAEKGISPFAPINTQAPPEKGKEAVVQEPERSWFQTKEERKKEKIAKALQEFDLALRGKKRKKKFMKDAKKKGEMT  
 AEERSQFEILKAQMFAERLAKRNRRAKRARAMPEEEEPVRGPAKKQKQGGKSVFDEELTNTSKKALKQYRAGPSFEERKQLGLPHQR  
 RGGNFKSNPDTRGGSSCRGLKKFMGAALKSLPCGKSSWLVLCLFSICLKKKNKNKKQHFGVVVVVYVAIFLSMSVNLPS

(+1)/(-2)ORF (SEQ ID NO: 44)

MEKIFISSSTKAEKGISPFAPINTQAPPEKGKEAVVQEPERSWFQTKEERKKEKIAKALQEFDLALRGKKRKKKFMKDAKKKGEMT  
 AEERSQFEILKAQMFAERLAKRNRRAKRARAMPEEEEPVRGPAKKQKQGGKSVFDEELTNTSKKALKQYRAGPSFEERKQLGLPHQR  
 RGGNFKSNPDTRGGSSCRGLKKFMGAALKSLPCGKSSWLVLCLFSICLKK(K)TKTKNNTLWWWYGT

Bax

(wt)ORF (SEQ ID NO: 45)

MDGSGEQPRGGGPTSSEQIMKTGALLQGFIQDRAGRMGGEAPELALDPVPQDASTKKLSECLKRIGDELDSNMELQRMIAAVDTD  
 SPREVFRVAADMFSDGNFNWGRVVALFYFASKLVLKALCTKVPELIRTIMGWTLDFLRERLLGWIQDQGGWDGLLSYFGTPTWQT  
 VTIFVAGVLTASLTIWKKMG

(-1)ORF (SEQ ID NO: 46)

MDGSGEQPRGGGPTSSEQIMKTGALLQGFIQDRAGRMGGRHPSWPWTRCLMRPPRS

(+1)/(-2)ORF (SEQ ID NO: 47)

MDGSGEQPRGGGPTSSEQIMKTGALLQGFIQDRAGRMGG(G)GTRAGPGPGASGCVHQEAERVSQAHRGRTGQ

TCF6L1

(wt)ORF (SEQ ID NO: 48)

MAFLRSMWGVLSALGRSGAELCTGCGSRLRSPFSFVYLPRWFSSVLASCPKPKPVSSYLRFSSKEQLPIFKAQNPDAKTTELIRRIAQR  
 WRELPSKKKIYQDAYRAEWQVYKEEISRFEQLTPSQIMSLEKEIMDKHLKRKAMTKKKELTLLGPKRPRSAYNVYVAERFQEAQ  
 GDSPQEKLTQVKNWKNLSDSEKELYIQHAKEDETRYHNEMKSWEEQMIIEVGRKDLLRRTIKKQRKYGAEEC

(-1)ORF (SEQ ID NO: 49)

MAFLRSMWGVLSALGRSGAELCTGCGSRLRSPFSFVYLPRWFSSVLASCPKPKPVSSYLRFSSKEQLPIFKAQNPDAKTTELIRRIAQR  
 WRELPSKKKIYQDAYRAEWQVYKEEISRFEQLTPSQIMSLEKEIMDKHLKRKAMTKKKKS

(+1)/(-2)ORF (SEQ ID NO: 50)

MAFLRSMWGVLSALGRSGAELCTGCGSRLRSPFSFVYLPRWFSSVLASCPKPKPVSSYLRFSSKEQLPIFKAQNPDAKTTELIRRIAQR  
 WRELPSKKKIYQDAYRAEWQVYKEEISRFEQLTPSQIMSLEKEIMDKHLKRKAMTKKK(K)RVNTAWKTKTSFSL

FTL3L

(wt)ORF (SEQ ID NO: 51)

MTVLAPAWSPTTYLLLLLLSSGLSGTQDCSFQHSPISSDFAVKIRELSYLLQDYPVTVASNLQDEELCGGLWRLVLAQRWMERLKT  
 VAGSKMQGLLERVNTIEHFVTKCAFQPPPSCLRFVQTNISRLQETSEQLVALKPWITRQNFSCRLELQCQPDSSSTLPPWPSPRPLE  
 ATAPTAPQLLLLLLLPVGLLLAAWCLHWQRTTRRTPRPGEQVPPVPSQDLLLLVEH

(-1)ORF (SEQ ID NO: 52)

MTVLAPAWSPTTYLLLLLLSSGLSGTQDCSFQHSPISSDFAVKIRELSYLLQDYPVTVASNLQDEELCGGLWRLVLAQRWMERLKT  
 VAGSKMQGLLERVNTIEHFVTKCAFQ  
 PPPAVFASSRPTSPASCRPPSSWWR

FIG. 2-5

**(+1)/(-2)ORF (SEQ ID NO: 53)**

MTVLAPAWSPTTYLLLLLLSSGLSGTQDCSFQHSPISSDFAVKIRELSYLLQDYPVTVASNLQDEELCGGLWRLVLAQRWMERLKT  
VAGSKMQGLLERVNTIEHFVTKCAFQ  
PP(P)QLSSLRPDQHLPPPAGDLRAAGGAEALDHPELLVPVGAASAR

**OGT****(wt)ORF (SEQ ID NO: 54)**

MLQGHFWLVREGIMISPPSPPPNLFFFPLQIFPFPFTSFPSHLLSLTPPKACYLKAJETQPNFAVAWSNLGCVFNAQGEIWLAIHFE  
KAVTLDPNFLDAYINLGNVLKEARIFDRAVAAYLRALSLSPNHAVVHGNLACVYVEQGLIDLADTYRRAIELQPHFPDAYCNLANALKE  
KGSVAEEDCYNTALRLCPTHADSLNNLANIKREQGNIIEAVRLYRKALEVFPEFAAAHSNLASVLQQQKGLQEALMHYKEAIRISPTF  
ADAYSNMGNTLKEMQDVQGALQCYTRAIQINPAFADAHSNLASIHKDSGNIPEAIASYRTALKLPDFPDAYCNLAHCLQIVCDWTDY  
DERMKKLVSIADQLEKNRLPSVHPHSMMLYPLSHGFRKAIAERHGNLCLDKINVLHKPPYEHPKDLKLSDGRLRVGYVSSDFGNHPT  
SHLMQSIGPMHNPDKEFVFCYALSPDDGTNFRVKVMAEANHFIDLQIPCNCGKAADRIHQDGIHILVNMNGYTKGARNELFALRPAPI  
QAMWLGYPGTSGALFMDYITDQETSPAEEVAEQYSEKLAYMPHTFFIGDHANMFPHLKKKKAVIDFKSNGHIYDNRIVLNGIDLKAFDLS  
LPDVKIVKMKCPDGGDNADSSNTALNMPVIMNTIAEAVIEMINRGQIQITINGFSISNGLATTQINNKAATGEEVPTIIVTTRSQYGLP  
EDAIVYCNFNQYKIDPSTLQMWANILKRVPSVLLWRFPVAVGEPNIQYQAQNMGLPQNRRIIFSPVAPKEEHVRRGQLADVCLDTPL  
CNGHTTGMDVLWAGTPMVTMPGETLASRVAASQLTCLGCELIAKNRQEYEDIAVKLGTDLLEYLKKVRGKVVWQRISSPLFNTKQYT  
MELERLYLQMWEEHYAAGNKPDHMIKPVETESA

**(-1)ORF (SEQ ID NO: 55)**

MLQGHFWLVREGIMISPPSPPPNLF~~SLYKFSFPFLPPFPPIFFH~~

**(+1)/(-2)ORF (SEQ ID NO: 56)**

MLQGHFWLVREGIMISPPSPPPNLF~~(F)PTNFPLSLYLLSLPSSFINPS~~

**ELAVL3****(wt)ORF (SEQ ID NO: 57)**

MESQVGGGPAGRPAQRPLLTNGATDDSKTNLIVNYPQNMTQDEFKSLFGSIGDIESCKLVRDKITGQSLGYGFVNYSNDPNADKA  
INTLNLGLQTKTIKVSYPARPSSASIRDANLYVSGLPKTMQKEMEQLFSQYGRITSRILVDQVTGVSRGVGFIRFDKRIEAEAAIKGLN  
GQKPLGAREPITVKFANNPSQKTGQALLTHLYQSSARRYAGPLHHQTQRFRLDNLNLMAYAVKRFSPIADGMSGLAGVGLSGGAAG  
GWCIFVYNLSPEPDQSVLWQLFGPFGAVTNKVIRDFTTNCKCKGFGFMTMTNYDEAAMAIASLNGYRLGQVRVLQVSFKTSKQHKHA

**(-1)ORF (SEQ ID NO: 58)**

MESQVGGGARPA~~GLPNHSLVQMEPLTTARPTSSSTTCPT~~

**(+1)/(-2)ORF (SEQ ID NO: 59)**

MESQVGG(G)~~PGRPACPTATPWYKWSH~~

**MAC30X****(wt)ORF (SEQ ID NO: 60)**

LFSHQRVQAQPTDYGGSFTRRCVEWLLGLYFLSHIPITLFMDLQAVVPRELYPVEFRNLLKWYAKEFKDPLLQEPPAWFKSFLFCELV  
FQLPFFPIATYAFKLGSCKWIRTPAIIYSVHTMTLILILSTFLFEDFSKASGFKGQRPETLHERLTLVSVYAPYLLIPFILLIFMLRSPYYKY  
EEKRKKK

**(-1)ORF (SEQ ID NO: 61)**

LFSHQRVQAQPTDYGGSFTRRCVEWLLGLYFLSHIPITLFMDLQAVVPRELYPVEFRNLLKWYAKEFKDPLLQEPPAWFKSFLFCELV  
FQLPFFPIATYAFKLGSCKWIRTPAIIYSVHTMTLILILSTFLFEDFSKASGFKGQRPETLHERLTLVSVYAPYLLIPFILLIFMLRSPYYKY  
EEKRKKK~~NEGNHNPVEMPTGWLLVGYIQEHCEPTSSAAFETLAAMHKSVMVSGTMSNPILLPFFFF~~

**(+1)/(-2)ORF (SEQ ID NO: 62)**

LFSHQRVQAQPTDYGGSFTRRCVEWLLGLYFLSHIPITLFMDLQAVVPRELYPVEFRNLLKWYAKEFKDPLLQEPPAWFKSFLFCELV  
FQLPFFPIATYAFKLGSCKWIRTPAIIYSVHTMTLILILSTFLFEDFSKASGFKGQRPETLHERLTLVSVYAPYLLIPFILLIFMLRSPYYKY  
EEKRKK(K)~~MKETTTGPG~~

**SLC4A3****(wt)ORF (SEQ ID NO: 63)**

MANGVIPPVGGASPLPQVRVPLEEPPLSPDVEEEDDDLGKTLAVSRFGDLISKPPAWDPEKPSRSYSERDFEFHRHTSHHTHHPLSA  
RLPPPHKLRLPPTSARHTRRKRRKKEKTSAPPSEGTPIQEEGGAGVDEEEEEEEEEEGESEAEPVEPPPSGTPQKAKFSIGSDEDD  
SPGLPGRAAVTKPLPSVGPHTDKSPQHSSSSSPRARASRLAGEKSRPWSPSASYDLRERLCPGSALGNPGGPEQQVPTDEAEAQ  
MLGSADLDDMKSHRLEDNPGVRRHLVKKPSRTQGGGRGSPGLAPILRRKKKKKKLDRRPHEVFELNELMLDRSQEPHWRETARW  
IKFEEDVEEETERWGKPHVASLSFRSLELRRTIAHGAALLDLEQTTLPGLAHLVETMIVSDQIRPEDRASVLRLLLLKHSHPNDDKDS  
GFFPRNPSSSSMNSVLGNHHTPSPHGPDGAVPTMADDLGEPAWPHDPDAKEKPLHMPGGDGHGKSLKLEKIPEDAEATVVL  
VGCVPFLEQPAAAFVRLNEAVLLESVLEVPVVRFLVMLGPSHTSTDYHELGRSIATLMSDKLFHEAAYQADDRQDLLSAISEFLDG  
SIVIPPSEVEGRDLLRSVAAFQRELLRKRREREQTKVEMTTTRGGYTAPGKLSLELGGSEATPEDDPLRTGSVFGGLVRDVRRRYP  
HYPDLRLDALHSQCVAALFYFAALSPAITFGGLLGEKTEGLMGVSELIVSTAVLGVLFSLGAQPLLVGFGSGLLVFEEAFFKFCRA  
QDLEYLTGRVWVGLWLVVFLVLAALVAEAGSFLVRYISPFTQEIFAFLISLIFYETFYKLYKVFTHEPPLPFYPPEGALEGLAAGLEPNGS  
ALPPTGPPSPRNQPNNTALLSLILMLGTFFFIAFLRKFNRNSRFLGGKARRIIGDFGIPISILVMVLVDYSITDTYTKLTVPTGLSVTSPDK  
RSWFIPPLGSARPPPPWMMVAAPVALLVILIFMETQITALIVSQARRLLKSGGFHLDLLIGSLGGLCGLFGLPWLTAAATVRSVTHV  
NALVTMRTAIAPGDKPIQEVREQRVTGVLIASLVGLSIVMGAVLRRIPLAVLFGIFLYMGVTSLSGIQLSQRLLILMPAKHHPEQPYVT  
KVKTWRMHFLTICQLGCIALLWVKSTAASLAFPLLLLLTVPLRHCLLPRLFQDRELQALDSEDAEPNFDGEDGQDEYNELHMPV

**(-1)ORF (SEQ ID NO: 64)**

MANGVIPPVGGASPLPQVRVPLEEPPLSPDVEEEDDDLGKTLAVSRFGDLISKPPAWDPEKPSRSYSERDFEFHRHTSHHTHHPLSA  
RLPPPHKLRLPPTSARHTRRKRRKKEKTSAPPSEGTPIQEEGGAGVDEEEEEEEEEEGESEAEPVEPPP~~QGPHRQSSPLEVTRM~~  
~~TVQASLGGLLSPSPCPRWAHTLTRAPSTPAAPPAGPGPPDSLGRKAGPGAHRPVMTCGSDCAQAVPWATQVVQSSRCQPMRRR~~  
~~PRCWLTQWT~~

**(+1)/(-2)ORF (SEQ ID NO: 65)**

MANGVIPPVGGASPLPQVRVPLEEPPLSPDVEEEDDDLGKTLAVSRFGDLISKPPAWDPEKPSRSYSERDFEFHRHTSHHTHHPLSA  
RLPPPHKLRLPPTSARHTRRKRRKKEKTSAPPSEGTPIQEEGGAGVDEEEEEEEEEEGESEAEPVEPP(P)~~LRDPTEGKVLHWK~~

FIG. 2-6

**PRKDC****(wt)ORF (SEQ ID NO: 66)**

MAGSGAGVRCSSLRLQETLSAADRCGAALAGHQLIRGLGQECVLSSSPAVLALQTSLVFSRDFGLLVFVRKSLNSIEFRECREEILKFL  
CIFLEKMGQKIAPYSVEIKNTCTSVYTKDRAACKIPALDLLIKLLQTFRSSRLMDEFKIGELFSKFYGELALKKKIPDTVLEKVVYELLGLL  
GEVHPSEMINNAENLFRALGELKTQMTSAVREP KLPVLAGCLKGLSSLLCNFTKSMEEPQTSREIFNFVLKAIRPQIDLKRYAVPSA  
GLRLFALHASQFSTCLLDNYVSLFEVLLKWC AHTNVELKKAALSALESFLKQVSNMVAKNAEMHKNLQYFMEQFYGIIRNVDSNNKE  
LSAIRGYGLFAGPCKVINAKDVFMYVELIQRCQKMF LTQTDTGDDR VYQMP SFLQSVASVLLYLDTVPEVYTPVLEHLVVMQIDSFP  
QYSPKMQLVCCRAIVKVFALAAGPVL RNCISTVVHQGLIRICSKPVLPKGPESSESDHRASGEV RTGKWVPTYKYDYDLFRHLL  
SSDQMMD SILADEAFFSVNSSSESLNHLLYDEFVKSVLKIVEKLDLTLEIQTVGEQENGDEAPGVWMIPTSDPAANLHPAKPKDFSAFI  
NLVEFCREILPEKQAEFFEPWVVSFSYELILQSTRPLISGFYKLLSITVRNAKKIKYFEGS

**(-1)ORF (SEQ ID NO: 67)**

MAGSGAGVRCSSLRLQETLSAADRCGAALAGHQLIRGLGQECVLSSSPAVLALQTSLVFSRDFGLLVFVRKSLNSIEFRECREEILKFL  
CIFLEKMGQKIAPYSVEIKNTCTSVYTKDRAACKIPALDLLIKLLQTFRSSRLMDEFKIGELFSKFYGELALKKKYQIQF

**(+1)/(-2)ORF (SEQ ID NO: 68)**

MAGSGAGVRCSSLRLQETLSAADRCGAALAGHQLIRGLGQECVLSSSPAVLALQTSLVFSRDFGLLVFVRKSLNSIEFRECREEILKFL  
CIFLEKMGQKIAPYSVEIKNTCTSVYTKDRAACKIPALDLLIKLLQTFRSSRLMDEFKIGELFSKFYGELALKK(K)NTSYSFRKS

**UVRAG****(wt)ORF (SEQ ID NO: 69)**

MSASASVGGPVPQPPPGPAAALPPGSAARALHVELPSQQRRLRHLRNLIAARNIVNRNGHQLLDITYFTLHLCSTEKIYKEFYRSEVIKN  
SLNPTWRS LDFGIMPDRLDTSVSCFVVKIWGGKENIYQLLIEWKVCLDGLKYLGGQIHARNQNEIIFGLNDGYYGAPFEHKGYSNAQK  
TILLQVDQNCVRNSYDVFSLLRLHRAQCAIKQTQVTQKIGKEIEEKLRLTSTSNELKKKSECLQLKILVLQNELERQKKALGREVALLH  
KQQALQDKGSALFSAEHLKLQKQESLNELRKECTAKRELFLKTNAQLTIRCRQLLSELSYIYPIDLNEHKDYFVCGVKLPNSDFQAK  
DDGSI AVALGYTAHLVSMISFFLQVPLRYPPIHKGSRSTIKDNINDKLTEKEREFP LYPKGGEKLQFDYGVYLLNKNI AQLRYQHGLGTP  
DLRQTLPLNLKNFMELHGLMVRCDRHTTSSAIPVPKRQSSIFGGADVGFSGGIPSPDKGHRKRASSENERLQYKTPPPSYNSALAQPV  
TVPSMGETERKITSLSLSDTSLDFS KENKKGEDLVGSLNGGHANVHPSQEQQEALSGHRATVNGTLLPSEQAGSASVQLPGEFH  
PVSEALCCTVEQAEIIGLEAQVSPQVIS

**(-1)ORF (SEQ ID NO: 70)**

MSASASVGGPVPQPPPGPAAALPPGSAARALHVELPSQQRRLRHLRNLIAARNIVNRNGHQLLDITYFTLHLCSTEKIYKEFYRSEVIKN  
SLNPTWRS LDFGIMPDRLDTSVSCFVVKIWGGKENIYQLLIEWKVCLDGLKYLGGQIHARNQNEIIFGLNDGYYGAPFEHKGYSNAQK  
TILLQVDQNCVRNSYDVFSLLRLHRAQCAIKQTQVTQKIGKEIEEKLRLTSTSNELKKKVNACS

**(+1)/(-2)ORF (SEQ ID NO: 71)**

MSASASVGGPVPQPPPGPAAALPPGSAARALHVELPSQQRRLRHLRNLIAARNIVNRNGHQLLDITYFTLHLCSTEKIYKEFYRSEVIKN  
SLNPTWRS LDFGIMPDRLDTSVSCFVVKIWGGKENIYQLLIEWKVCLDGLKYLGGQIHARNQNEIIFGLNDGYYGAPFEHKGYSNAQK  
TILLQVDQNCVRNSYDVFSLLRLHRAQCAIKQTQVTQKIGKEIEEKLRLTSTSNELKKK(K)

**MSH3****(wt)ORF (SEQ ID NO: 72)**

MSRRKPASGGGLAASSAPARQAVLSRFFQSTGSLKSTSSSTGAADQVDPGAAAAAAAAAAPPAPPAPAFPPQLPPHVATEIDRR  
KKRPLENDGPVKKKVKVQKQEGGSDLGMSGNSEPKKCLRTNRVSKSLEKLKEFCDSALPQSRVQTESLQERFAVL PKCTDFDDI  
SLLHAKNAVSSEDSKRQINQKDTTLFDLSQFGSSNTSHENLQKTASKSANKRSKSIYTPLELQYIEMKQKHDAVLCVECGYKYRFFG  
EDAEIAARELN IYCHLDHNFMTASIPTHRLFVHVRRLVAKGYKVG VVKQTETAALKAIGDNRSSLFSRKL TALYTKSTLIGEDVNPLIKLD  
DAVNVDEIMTDTSTSYLLCISENKENVRDKKGNIFIGVGVQPATGEVVFDSFQDSASRSELETRMSSLPQVELLLPSALSEQTEALIH  
RATSVSVQDDRI RVERMDNIYFEYSHAFQAVTEFYAKDTV DIKGSQIISGIVNLEKPVICSLAAIKYLKEFNLEKMLSKPENFKQLSSKM  
EFMTINGTTLRNLEILQNQDTMKTKGSLLVVLDHTKTSFGRRRLKKWVTQPLLKLEINARLDAVSEVLHSESSVFGQIENHLRKL PDI  
GRGLCSIYHKKCS TQEFFLIVKTYLHLKSEFQAIIPAVNSHIQSDLLRTVILEIPELLSPVEHYLKILNEQA AKVGDKTELFDKLSDFLIKK  
RKDEIQGVIDEIRMHLEIRKILKNPSAQYVTVSGQEFMIEIKNSAVSCIPTDWVKVGSTKAVSRFHS PFIVENYRHLNQLREQLVDCS  
AEWLDLFLEKFSEHYHSLCKAVHHLATVDCIFSLAKVAKQGDYCRPTVQEERKIVIKNGRHPVIDVLLGEQDQYVPNNTDLSEDSERVM  
IITGPNNMGKSSYIKQVALITIMAQIGSYVPAEEATIGIVDGI FTRMGAADNIYKGRSTFMEELTDTA EIIRKATSQS LVIDELGRGTSTH  
DGAIAIAYATLEYFIRDVKS LTFVTHYPPVCELEKNYSHQVGN YHMGFLVSEDESKLDPGTAEQVPDFVTFLYQITRGIAARSYGLNVA  
KLADVPGEILKKAHKSKELEGLINTKRRLKYFAKLWTMHNAQDLQKWTEEFNMEETQTSLLH

**(-1)ORF (SEQ ID NO: 73)**

MSRRKPASGGGLAASSAPARQAVLSRFFQSTGSLKSTSSSTGAADQVDPGAAAAAAAAAAPPAPPAPAFPPQLPPHVATEIDRR  
KKRPLENDGPVKKKVKVQKQEGGSDLGMSGNSEPKKCLRTNRVSKSLEKLKEFCDSALPQSRVQTESLQERFAVL PKCTDFDDI  
SLLHAKNAVSSEDSKRQINQKDTTLFDLSQFGSSNTSHENLQKTASKSANKRSKSIYTPLELQYIEMKQKHDAVLCVECGYKYRFFG  
EDAEIAARELN IYCHLDHNFMTASIPTHRLFVHVRRLVAKGYKVG VVKQTETAALKAIGDNRSSLFSRKL TALYTKSTLIGEDVNPLIKLD  
DAVNVDEIMTDTSTSYLLCISENKENVRDKKRATFLALWECSLPQARCLIVSRITLLVQS

**(+1)/(-2)ORF (SEQ ID NO: 74)**

MSRRKPASGGGLAASSAPARQAVLSRFFQSTGSLKSTSSSTGAADQVDPGAAAAAAAAAAPPAPPAPAFPPQLPPHVATEIDRR  
KKRPLENDGPVKKKVKVQKQEGGSDLGMSGNSEPKKCLRTNRVSKSLEKLKEFCDSALPQSRVQTESLQERFAVL PKCTDFDDI  
SLLHAKNAVSSEDSKRQINQKDTTLFDLSQFGSSNTSHENLQKTASKSANKRSKSIYTPLELQYIEMKQKHDAVLCVECGYKYRFFG  
EDAEIAARELN IYCHLDHNFMTASIPTHRLFVHVRRLVAKGYKVG VVKQTETAALKAIGDNRSSLFSRKL TALYTKSTLIGEDVNPLIKLD  
DAVNVDEIMTDTSTSYLLCISENKENVRDKK(K)GQHFYWHCGSAACHRRGCV

**ACVR2,****(wt) ORF (SEQ ID NO: 107)**

MGAAAKLAF A VFLISCSGA ILGRSETQEC LFFNANWEKD RTNQTGVEPC YGDKDKRRHC FATWKNISGS IEIVQGQCWL  
DDINCYDRTD CVEKKSPEV YFCCCEGNMC NEKFSYFPEM EVTQPTSNPV TPKPPYYNIL LYSVLPLMLI AGIVICAFWV

FIG. 2-7

YRHHKMAYPP VLVPTQDPGP PPPSPLLGLK PLQLLEVkar GRFGCVWKAQ LLNEYVAVKI FPIQDKQSWQ NEYEVYSLPG  
MKHENILQFI GAEKRGTSVD VDLWLITAFH EKGSLSDFLK ANVVSWNELC HIAETMARGL AYLHEDIPGL KDGHKPAISH  
RDIKSKNVLL KNNLTACIAD FGLALKFEAG KSAGDTHGQV GTRRYMAPEV LEGAINFQRD AFLRIDMYAM GLVLWELASR  
CTAADGPVDE YMLPFEEIEG QHPSLEDME VVHKKKRPV LRDYWQKHAG MAMLCETIE CWDHDAEARL SAGCVGERIT  
QMQRLTNIIT TEDIIVVTM VTNVDFPPKE SSL\*

A8, Pos. 451: -1 ORF (Mut.rate 16.3%) (SEQ ID NO: 108)

MGAAAKLafa VFLISCSSGA ILGRSETQEC LFFNANWEKD RTNQTGVEPC YGDKDKRRHC FATWKNISGS IEIVKQGCWL  
DDINCYDRTD CVEKKTALKY IFVAVRAICV MKSFLIFRRW KSHSPLQIQL HLSHPITTSC SIPWCHLC\*

A8 Pos. 1476: -1 (Mut.rate 81.6%) (SEQ ID NO: 109)

MGAAAKLafa VFLISCSSGA ILGRSETQEC LFFNANWEKD RTNQTGVEPC YGDKDKRRHC FATWKNISGS IEIVKQGCWL  
DDINCYDRTD CVEKKDSPEV YFCCCEGNMC NEKFSYFPEM EVTQPTSNPV TPKPPYYNII LYSVLPLMI AGIVICAFWV  
YRHHKMAYPP VLVPTQDPGP PPPSPLLGLK PLQLLEVkar GRFGCVWKAQ LLNEYVAVKI FPIQDKQSWQ NEYEVYSLPG  
MKHENILQFI GAEKRGTSVD VDLWLITAFH EKGSLSDFLK ANVVSWNELC HIAETMARGL AYLHEDIPGL KDGHKPAISH  
RDIKSKNVLL KNNLTACIAD FGLALKFEAG KSAGDTHGQV GTRRYMAPEV LEGAINFQRD AFLRIDMYAM GLVLWELASR  
CTAADGPVDE YMLPFEEIEG QHPSLEDME VVHKKKRL\*

FLJ11053, A11 Pos. 1695, Mut.rate 52.2%

wt ORF (SEQ ID NO: 110)

MVLRKLSKDD VTTLKAMQE FGTMCterDT ETVKGVLPYW PRIFCKISLD HRRVREATQ QAFEKLTlKV KKQLAPYLKS  
LMGYWLMaQC DTYTPAAFAA KDAFEAAFP SKQPEAIAFC KDEITSVLQD HLIKETPDTL SDPQTVPEEE REAKFYRVVT  
CSLLALKRLL CLLPDNElDS LEEKFKSLLS QNKFWKYGKH SVPQIRSAyf ELVSALCQRI PQLMKEEASK VSPSVLLSID  
DSDPIVCPAL WEAVLYTLTT IEDCWLHVNA KKSVPFKLST VIREGGRGLA TVIYPYLLPF ISKLPHSITN PKLDFFKNFL  
TSLVAGLSTE RTKTSSSESS AVISAFYECL RFIMQQNLGE EEIEQMLVND QLIPFIDAVL KDPGLQHGLQ FNHLAETLSS  
WEAKADTEKD EKTahNLEnv LIHFWERLSE ICvakISEPE ADVESVLGVS NLLQVLQKPK SSLKSSKKKN GKVRFADEIL  
ESNKENEKCV SSEGEKIEGW ELTTEPSLTH NSSGLLSPLR KKPLEDLVCK LADISINYVN ERKSEQHLRF LSTLLDSFSS  
SRVFKMLLGD EKQSIvQAKP LEIAKLvQKN PAVQFLYQKL IGWLNEDQRK DFGFLVDILY SALRCCDNDM

-1 ORF (SEQ ID NO: 111)

MVLRKLSKDD VTTLKAMQE FGTMCterDT ETVKGVLPYW PRIFCKISLD HRRVREATQ QAFEKLTlKV KKQLAPYLKS  
LMGYWLMaQC DTYTPAAFAA KDAFEAAFP SKQPEAIAFC KDEITSVLQD HLIKETPDTL SDPQTVPEEE REAKFYRVVT  
CSLLALKRLL CLLPDNElDS LEEKFKSLLS QNKFWKYGKH SVPQIRSAyf ELVSALCQRI PQLMKEEASK VSPSVLLSID  
DSDPIVCPAL WEAVLYTLTT IEDCWLHVNA KKSVPFKLST VIREGGRGLA TVIYPYLLPF ISKLPHSITN PKLDFFKNFL  
TSLVAGLSTE RTKTSSSESS AVISAFYECL RFIMQQNLGE EEIEQMLVND QLIPFIDAVL KDPGLQHGLQ FNHLAETLSS  
WEAKADTEKD EKTahNLEnv LIHFWERLSE ICvakISEPE ADVESVLGVS NLLQVLQKPK SSLKSSKKKN VRLDLLMRYL  
KAIKRMKNVY LQKERRLKAG N\*

-2 ORF (SEQ ID NO: 112)

MVLRKLSKDD VTTLKAMQE FGTMCterDT ETVKGVLPYW PRIFCKISLD HRRVREATQ QAFEKLTlKV KKQLAPYLKS  
LMGYWLMaQC DTYTPAAFAA KDAFEAAFP SKQPEAIAFC KDEITSVLQD HLIKETPDTL SDPQTVPEEE REAKFYRVVT  
CSLLALKRLL CLLPDNElDS LEEKFKSLLS QNKFWKYGKH SVPQIRSAyf ELVSALCQRI PQLMKEEASK VSPSVLLSID  
DSDPIVCPAL WEAVLYTLTT IEDCWLHVNA KKSVPFKLST VIREGGRGLA TVIYPYLLPF ISKLPHSITN PKLDFFKNFL  
TSLVAGLSTE RTKTSSSESS AVISAFYECL RFIMQQNLGE EEIEQMLVND QLIPFIDAVL KDPGLQHGLQ FNHLAETLSS  
WEAKADTEKD EKTahNLEnv LIHFWERLSE ICvakISEPE ADVESVLGVS NLLQVLQKPK SSLKSSKKKN W\*

+1 ORF (SEQ ID NO: 113)

MVLRKLSKDD VTTLKAMQE FGTMCterDT ETVKGVLPYW PRIFCKISLD HRRVREATQ QAFEKLTlKV KKQLAPYLKS  
LMGYWLMaQC DTYTPAAFAA KDAFEAAFP SKQPEAIAFC KDEITSVLQD HLIKETPDTL SDPQTVPEEE REAKFYRVVT  
CSLLALKRLL CLLPDNElDS LEEKFKSLLS QNKFWKYGKH SVPQIRSAyf ELVSALCQRI PQLMKEEASK VSPSVLLSID  
DSDPIVCPAL WEAVLYTLTT IEDCWLHVNA KKSVPFKLST VIREGGRGLA TVIYPYLLPF ISKLPHSITN PKLDFFKNFL  
TSLVAGLSTE RTKTSSSESS AVISAFYECL RFIMQQNLGE EEIEQMLVND QLIPFIDAVL KDPGLQHGLQ FNHLAETLSS  
WEAKADTEKD EKTahNLEnv LIHFWERLSE ICvakISEPE ADVESVLGVS NLLQVLQKPK SSLKSSKKKN W\*

KIAA1052, A11 Pos. 689, Mut.rate 42.2%

Wt ORF (SEQ ID NO: 114)

MAGRPLRIGD QLVLEEDYDE TYIPSEQEIL EFAREIGIDP IKEPELmwLA REGIVAPLPg EWKPCQDITG DIYYFNfANG  
QSMWDHPCDE HYRSLVIER AKLSTSGAIK KKKKKKEKDD KKDRDPKSS LALGSSLAPV HVPLGGLAPL RGLVDTPPSA  
LRGSQSVSLG SSVESGRQLG ELMLPSQGLK TSAYTKGLLG SIYEDKTALS LLGLGEETNE EDEEESDNQS VHSSEPLRN  
LHLDIGALGG DFEYEESLRT SQPEEKDVS LDSDAAGPPT PCKPSSPGAD SSLSSAVGKG RQGSARPGL PEKEENEKSE  
PKICRNlVTP KADPTGSEPA KASEKEAPED TVDAGEEGSR REEAAKEPKK KASALEEGSS DASQEISE HMKEPQLSDS  
IASDPKSFHG LDFGFRSRIS EHLLDVDVLS PVLGGACRQA QPLGIEDKD DSQSSQDELQ SKQSKGLEER YHRLSPPLPH  
EERAQSPPRS LATEEEPPQG PEGQPEWKEA EELGEDSAAS LSLQLSLQRE QAPSPPAACE KGKEQHSQAE ELPGQEEAE  
DPEEKVAVSP TPPVSPEVRS TEPVAPPEQL SEAALKAMEE AVAQVLEQDQ RHLLSKQEK MQQLREKLCQ EEEEEILRLH  
QQKEQSLSSL RERLQKAIIE EEARMREES QRLSWLRAQV QSSTQADEQ IRAEQEASLQ KLREELESQQ KAERASLEQK

## FIG. 2-8

NRQMLEQLKE EIEASEKSEQ AALNAAKEKA LQQLREQLEG ERKEAVATLE KEHSAELERL CSSLEAKHRE WVSSLQKKIQ  
 EAQQKEEAQL QKCLGQVEHR VHQKSYHVAG YEHELSSLLR EKRQEVEGEH ERRLDKMKKEE HQQVMAKARE QYEAEEKQR  
 AELLGHLTGE LERLQRAHER ELETVRQEQH KRLEDLRRRH REQERKLQDL ELDLETRAKD VKARLALLEV QEETARREKQ  
 QLLDVQRQVA LKSEEATATH QQLEEAQKEH THLLQSNQQL REILDELQAR KLIKLESQVDL LQAQSQQLQK HFSSLEAEAQ  
 KKQHLLREVT VEENNASPHF EPDLHIEDLR KSLGTNQTKE VSSLSQSKE DLYLDSLSSH NVWHLLSAEG VALRSAKEFL  
 VQQTRSMRRR QTALKAAQQH WRHELASAE VAKDPPGIKA LEDMRKNLEK ETRHLDKMS AMRKGHNLLK KKEEKLNLQLE  
 SSLWEEASDE GTLGGSPKK AVTFDLSDMD SLSSSESSEF SPPHLDSTPS LTRKIHGLS HSLRQISSQL SSVLSILDSL  
 NPQSPPLLA SMPAQLPPRD PKSTPTPTYY GSLARFSALS SATPTSTQWA WDSGQGPRLP SSSVAQTVDDF LLEKWRKYFP  
 SGIPLLSNP TPLESRLGYM SASEQLRLLQ HSHSQVPEAG STTFQGIIEA NRRWLERVKN DPRLPLFSST PKPKATLSLL  
 QLGLDEHNRV KVYRF\*

- 1 ORF (SEQ ID NO: 115)

MAGRPLRIGD QLVLEEDYDE TYIPSEQEL EFAREIGIDP IKEPELMWLA REGIVAPLPG EWKPCQDITG DIYYFNFANG  
 QSMWDHPCDE HYRSLVIQER AKLSTSGAIK KKKKKRKRKT RRTETPPKVR WPWVPH\*

- 2 ORF (SEQ ID NO: 116)

MAGRPLRIGD QLVLEEDYDE TYIPSEQEL EFAREIGIDP IKEPELMWLA REGIVAPLPG EWKPCQDITG DIYYFNFANG  
 QSMWDHPCDE HYRSLVIQER AKLSTSGAIK KKKKKGKERQ EGQRPPQKFA GLGFLISPSS CSSWGPFSFT RSCGYPTLCS  
SWISKREPG LSGVWTSARW THAAFTGSQD LCCLYKGSGLHI\*

+ 1 ORF (SEQ ID NO: 117)

MAGRPLRIGD QLVLEEDYDE TYIPSEQEL EFAREIGIDP IKEPELMWLA REGIVAPLPG EWKPCQDITG DIYYFNFANG  
 QSMWDHPCDE HYRSLVIQER AKLSTSGAIK KKKKKGKER QEGQRPPQKF AGLGFLISPS SCSSWGPFSF TRSCGYPTLC  
SSWISKREPG ELSGVWTSARW THAAFTGSQ DLCLYKGSGLG LHI\*